DRAFT FINAL

PROCESS AREAS WORK PLAN

JANUARY 14, 2003

PREPARED FOR:

Atlantic Richfield Company
307 EAST PARK STREET, SUITE 400
ANACONDA, MONTANA 59711

PREPARED BY:

BROWN AND CALDWELL

Carson City, Nevada

Atlantic Richfield Company

307 East Park Street
Suite 400
Anaconda, Montana 59711
Phone: (406) 563-5211
Fax: (406) 563-8269

January 14, 2003

Mr. Arthur G. Gravenstein, P.E.
Staff Engineer
Bureau of Corrective Actions -- Remediation Branch
Nevada Division of Environmental Protection
333 W. Nye Lane
Carson City, Nevada 89701

Subject: Response to Comments on the Draft Process Areas Work Plan dated August 26, 2002, and Submittal of the Draft Final Process Areas Work Plan

Atlantic Richfield Company appreciates this opportunity to respond to the comments provided by the regulatory agencies on October 24, 2002 for the subject document. Please find attached the Draft Final Process Areas Work Plan, modified to reflect the review comments.

NDEP Comments

NDEP Specific Comments

Page 1
Comprehensive site wide health and safety plan and a Quality Assurance Project Plan must be submitted for review and approval. These reports must be reviewed and approved before work plan field work can begin.

Response: "The Draft Quality Assurance Project Plan (QAPP) and Site Health and Safety Plan (SHSP) were submitted on December 6, 2002."

All underground utilities and preferred migration pathways must be evaluated and sampled if warranted.

Response: "The attached Draft Final Process Areas Work Plan includes the proposed evaluation of underground utilities, including sewer lines. A map is provided to assist in the identification of migration pathways from these underground utilities."

The Analysis list needs to be expanded to include 8260, 8270, 8080, tph, metals, 8150 where warranted.

Response: "The following analyses and methods are identified in the attached Draft Final Work Plan and will be implemented for the proposed field investigations:

Volatile Organic Compounds by GC/MS Capillary Column; Method 8260B.
Semi-volatile Organic Compounds by GC/MS Capillary Column; Method 8270C.
Organochlorine Pesticides by Cap Column GC; Method 8081A
Poly-chlorinated biphenols by Cap Column GC; Method 8082.
Chlorinated Herbicides by GC Cap Column; Method 8151A.
Gasoline Range Organics / Diesel Range Organics / Non-halogenated Volatiles including Total Petroleum Hydrocarbons by GC/FID; Method 8015B-GRO, DRO.

Analyses for metals are presented in Table 3 of the attached Draft Final Work Plan. The determination of which analyses will be conducted for specific locations within the Process Areas will be based on historical activities at each location and the results of field screening activities, as proposed in the Draft Final Work Plan."

<u>Page 2</u>
Second sentence states the process components addressed in this Work Plan are located in the central portion of the mine site. There are several buildings and structures that have been left out. The main process area is in the central portion of the property. I will detail the left out facilities farther on in the comments.

There is no mention of the dump leaching process. The fluids were sent out to the dump leach on the W3 WRA and the pregnant solution was returned to the process area.

Response: "The attached Draft Final Work Plan has been revised to reflect this comment. Operations and process flow information on W-3 leaching is included in the Draft Final Work Plan, and will be used in conducting the field investigations."

There is no mention of the acid plant. The acid plant was a major portion of the original process facilities. It is buried under the Arimetco phase II leach pad. It may be impracticable to sample the original soils since it is under 100 plus feet of leach pad, however it was significant enough that it needs to be noted. Someone reading this would never know that the facility ever existed.

Response: "Information on the acid plant has been added to the attached Draft Final Work Plan."

There is no mention that Unison operated the transformer reclamation facility in the truck shop.

Response: "Available information on the transformer reclamation facility operated by Unison in the truck shop has been added to the attached Draft Final Work Plan."

Preliminary investigation indicates that selenium was a by-product in the acid plant. Therefore, this warrants further evaluation. Note well WW10 has always had the highest selenium values.

Response: "A discussion of selenium as a by-product of the acid plant has been included in the attached Draft Final Work Plan."

<u>Page 3</u>
Last sentence is speculation. Constituents in the fluids may also have originated from the acid plant or crushed sulfide ore that was carried on a conveyor through the room in question. This room (conveyor way) has concrete walls and floor that could be retaining rain water runoff.

Response: "The attached Draft Final Work Plan has been revised to reflect this comment."

<u>Page 4; 1.4 Data Quality Objectives</u>
This section should also include sub-surface assessment related to buildings (ie underground utilities and preferred pathways of contaminant migration). For example, it is likely that solvents were discharged to sanitary sewers and then leaked through cracks in piping or discharged somewhere on the mine site.

Response: "Please see response to NDEP's second General Comment."

Last sentence, last paragraph page 4: "started" should be "stated"

Response: "The attached Draft Final Work Plan has been revised to reflect this comment."

Page 5, first paragraph: The results of field investigations must also be compared to regulatory action levels for the purpose of determining potential health effects, persistence, toxicity and potential to migrate to groundwater.

Response: "The DQOs presented in the Draft Process Areas Work Plan clearly stated that the proposed field investigations will be conducted to evaluate the potential risk to human health and the environment. The concepts reflected in this comment will be discussed in the Data Summary Report for the Process Areas and in the Final Permanent Closure Plan (FPCP) for the Yerington Mine Site."

<u>Precipitation Plant Section</u>
Add sentence each of the launderers also have numerous 8 inch diameter lead lined transfer points.

Response: "The information presented in this comment could not be verified, and reference to this information is not included in the attached Draft Final Work Plan. Atlantic Richfield proposes to investigate the existence and locations of these transfer points as part of the field investigations."

<u>Sulfide Plant</u>
Two underground concrete lined conveyor ways exit the ground on the west side of the plant and pass under the road to buried feed pockets on the opposite side.

Response: "The attached Draft Final Work Plan has been revised to reflect this comment."

<u>Primary and secondary Crushers</u>
There are partially buried and exposed underground concrete lined conveyor ways starting at the primary crusher and ending just south of the mega pond. The primary and secondary crusher buildings extend approximately two stories below ground level.

Response: "The attached Draft Final Work Plan has been revised to reflect this comment."

<u>Petroleum Fuel Filling Stations</u>
A gasoline filling station used to exist immediately east of the administration building. Arimetco removed the pumps in 1998. There are no records as to the status of the tanks.

Response: "The attached Draft Final Work Plan has been revised to reflect this comment."

<u>Water Tank</u>
This tank was used for fresh water for both the mine and Weed Heights.

Response: "The attached Draft Final Work Plan has been revised to reflect this comment."

Page 9; Wells
We believe the unnamed well is WW-23.

Response: "This has been verified and the attached Draft Final Work Plan has been revised to reflect this comment."

Facilities not listed in the section
All of the following areas must be evaluated and considered for possible soil sampling.

Just south of the privately owned bulk fueling stations is a gray metal clad building with associated pump box. This was part of Anaconda's fresh water system. Chlorine was added to the water at this location. This may be on land owned by Don Tibbals

On the southeast corner of the Phase One leach pad there are concrete foundations for a crushing plant, possibly built by Don Tibbals. There are also the remains of a lined area that once held an acid tank used by Arimetco.

Adjacent to monitor well WW8 there is a large concrete structure that appears to have been some type of pumping station.

Just east of pumpback well W-3 is a large metal clad building with associated out building and pump box. This appears to be on land owned by the Peri family. This facility looks like it was used as a pumping station for boosting or transferring fluids.

Just south east of pumpback well W-4 is a large concrete lined tank adjacent to the original Wabuska ditch. The top of the tank is at ground level and appears to have had two or more large pumps attached to it in the past. This was used as some type of pumping station.

Again there is no mention of the Anaconda acid plant. Even though it is buried it is probably significant enough to be referenced.

The main power substation and numerous smaller transformer stations show signs of oil leakage. These sites warrant soil sampling and should be addressed in the work plan.

Also buried under the south end of the Phase Two leach pad is the original Anaconda power station that consisted of three generators of one mega watt each. This should be noted for future reference.

No description of the remaining Arimetco crushing plant hopper and fine ore stockpile area. Originally the stockpile location was a lined area where strong sulfuric acid was added to the ore stream on the stacker belt. The ore was stockpiled on the lined area and allowed to acid cure. After curing the ore was moved by truck and loader to the VLT leach pad. Prior to cessation of mining operations Arimetco excavated the stockpile liner and placed it on the VLT leach pad. In Figure 5 the location noted as RR should be a proposed sample location.

On the northwest side of the Phase Two leach pad is a building listed as Tibbals storage. This building is owned by Don Tibbals and it sits on BLM land. It was once part of the Anaconda facilities and should be studied.

Response: "The attached Draft Final Work Plan has been revised to reflect the information on the mine unit components mentioned in this comment."

<u>Page 10; Work Plan</u>
All of the areas noted above that were left out of the original draft plan warrant inclusion in the soil investigations.

Response: "The attached Draft Final Work Plan has been modified to include these areas, as warranted, in the proposed field investigations."

Include sanitary sewers, other underground utility trenches and preferred pathways

Response: "The attached Draft Final Work Plan has been revised to include underground utility trench areas, as warranted, in the soil investigations."

<u>Page 12; Section 3.1</u>
How are soils to be composited? The compositing procedure should be outlined in this document and site-wide sampling and analysis plan. Also, some samples (below leaking sanitary sewers) should be discreet samples and not composited.

Response: "The attached Draft Final Work Plan has been revised to describe how samples are to be composited during the proposed field investigations."

What are "agricultural parameters"… all sampling and analysis should reference appropriate SW-846 sample methods. For agriculture, 8150, 8080 analysis are appropriate.

Response: "The attached Draft Final Work Plan has been revised to provide a more clear description of agricultural parameters. These parameters are used to evaluate the potential for soils to promote plant growth. It is anticipated that 8150 and 8080 analyses are warranted for most soils in the Process Areas because of their limited use at the site."

Field screening procedures will not be adequate to determine potential sources of chlorinated solvents, pesticides, pcb, herbicides and metals contamination.

Response: "Atlantic Richfield agrees that field screening will not be adequate to determine the presence of solvents, pesticides, pcb, and herbicides for specific locations within the Process Areas. These potential contaminants were not addressed in the Draft Process Areas Work Plan. However, the attached Draft Final Work Plan has been revised to include these potential contaminants and describe the approach to verify their presence or absence in specific locations where their use has been documented. Sampling for these potential contaminants will be conducted along with field screening activities for hydrocarbons and metals.

In addition, the range of laboratory analyses has been broadened in the attached Draft Final Work Plan to include analyses for solvents, pesticides, pcb, and herbicides for appropriate areas. The types of analyses conducted for submitted soil samples will be based on historical operations at the particular building or area. For example, if records indicate that pesticides were stored in a particular building, samples from in or around that building would be submitted for (along with any other appropriate analyses) 8080A Organochlorine Pesticides & PCBs."*

TV cameras in underground utility lines may be an appropriate field screening procedure for determining appropriate sampling locations to assess leakage.

Response: "Atlantic Richfield agrees that utility line inspection is a useful tool for locating potentially leaking pipe joints. The attached Draft Final Work Plan has been revised to describe the use of potential inspection methods, including TV cameras, to evaluate excavation and sampling locations along identified utility lines."

<u>Page 13; Section 3.2 Quality Assurance and Quality Control</u>
First paragraph: "trocedures" should be procedures

Response: "The attached Draft Final Work Plan has been revised to reflect this comment."

A site-wide QA/QC plan must be reviewed and approved by regulators per sow. This document has not yet been scheduled for submittal.

Response: "The QAPP was submitted on December 6, 2002."

QA/QC plan does not describe the compositing methods to be used

Response: "The attached Draft Final Work Plan has been revised to reflect this comment."

Page 14, First paragraph:
What kind of excavation equipment will be used and what are the excavation depth limits of this equipment.

Response: "Atlantic Richfield anticipates that a backhoe will be used with a maximum excavation depth of approximately 15 feet."

Sample Handling and Transport

Page 16
Other analysis is required (8260, 8270, 8080, 8150 etc). What about appropriate blanks? (trip blanks?)

Response: "As previously stated, the following analyses and methods have been added to the attached Draft Final Work Plan:

Volatile Organic Compounds by GC/MS Capillary Column; Method 8260B.
Semi-volatile Organic Compounds by GC/MS Capillary Column; Method 8270C.
Organochlorine Pesticides by Cap Column GC; Method 8081A
Poly-chlorinated biphenols by Cap Column GC; Method 8082.
Chlorinated Herbicides by GC Cap Column; Method 8151A.
Gasoline Range Organics / Diesel Range Organics / Non-halogenated Volatiles including Total Petroleum Hydrocarbons by GC/FID; Method 8015B-GRO, DRO.

The determination of which analyses will be conducted in specific locations within the Process Areas will be based on the available information on historic operations in and around each building or location. The attached Draft Final Work Plan has been revised to describe blank preparation, in accordance with the Draft QAPP."

<u>3.5 Site Job Safety Analysis</u>
We have not received a draft site safety and health plan as agreed in sow approval. This information is required and must be received not later than November 27, 2002.

Response: "The Site Health and Safety Plan (SHSP) was submitted on December 6, 2002."

<u>Figure 4 Comments</u>
The following areas identified in the figure may warrant analytical evaluation that is not proposed in your work plan (ie: analysis for voc, semi-voc, pesticides, pcbs, herbicides, metals etc) and may warrant other field screening methods that have not been proposed such as TV of underground utilities for the purpose of determining appropriate sample locations. Underground utility maps should be reviewed and included as figures in this workplan where appropriate Id: C, F, J, K, L, M, N, S, U, V, W, X Y, Z, DD, EE, LL, MM. THE SAME COMMENTS APPLY TO TABLE 1

Response: "Please see responses to previous comments."

<u>Table 4 Analysis and Methods</u>
Add the following SW-846 Methods: 8260, 8270, 8080, 8150.

Response: "Please see responses to previous comments."

EPA General Comments

1) This work plan does not propose a sufficient level of investigation for this area. At best, this work plan, when corrected and improved, might serve as the basis for a screening survey of the process area with the objective being to develop a subsequent detailed work plan for this area.

Response: "Atlantic Richfield believes that the proposed field investigations described in the attached Draft Final Work Plan provides a comprehensive site investigation that will collect the data necessary to develop and implement closure alternatives, not simply a screening survey, of the Process Areas. Atlantic Richfield requests that EPA provide specific recommendations in their comments to the attached Draft Final Work Plan, as appropriate, to ensure that proposed field investigations are sufficiently detailed. It is not anticipated that additional field investigations will be conducted in the Process Areas unless the results of the investigations proposed in the attached Draft Final Work Plan indicate such added information is necessary."

2) The Quality Assurance and Quality Control sections are incomplete and it is our understanding that Atlantic Richfield will be submitting a comprehensive site-wide Quality Assurance Project Plan (QAPP) in accordance with EPA's guidance documents (EPA will provide these on request or they can be obtained from EPA's website). After review of the QAPP, the agencies will further comment on any supplementary Quality Assurance/Quality Control sections in the specific work plans. Please provide a date for submittal of the QAPP as this must be reviewed and approved prior to initiation of fieldwork.

Response: "The Draft QAPP was submitted on December 6, 2002."

3) Radionuclide screening and/or analyses should be proposed. At a minimum, all samples should be screened for radionuclides and a percentage of samples should be analyzed in the laboratory. Also, EPA has heard from a former Arimetco employee (other than Joe Sawyer), that radionuclide activity has been detected around the large Anaconda leach vats.

Response: "As indicated in previous responses to comments, Atlantic Richfield has attempted to eliminate undocumented anecdotal information from providing the basis for field investigations proposed under the Scope of Work. If EPA possesses written information that documents the potential occurrence of radionuclides at the site, other than the environmental survey conducted by Anaconda in 1979, please share it with Atlantic Richfield."

EPA Specific Comments

1) Page 1; The discussion regarding exposure scenarios is incomplete. In order to provide a conservative estimate of risk for comparison, the residential exposure pathway is required to be assessed for each area. This also would give an evaluation of the risk any trespassers would encounter although every effort is underway to ensure that the Site is inaccessible. After the data is collected, it should be compared to screening values, such as EPA Region IX Preliminary Remediation Goals. At this time, the determination can be made as to the necessity of a risk assessment for a given area. There is also no discussion of the presence or absence of possible ecological receptors in the process area.

Response: "Atlantic Richfield acknowledges that the collected data may be compared to certain screening values, which will be presented in the Data Summary Report for the Process Areas. Given the current and anticipated future use of the site, an industrial rather than residential scenario is more appropriate. Such comparisons may serve as a tool for decision making at the site, which will be evaluated in the development of the Final Permanent Closure Plan.

Information about potential exposure pathways and receptors associated with the Process Areas is presented in Figure 3 of the attached Draft Final Work Plan. The Work Plan itself does not include a discussion about potential sources, pathways and receptors relevant to the Process Areas because this information was presented in the Site Conceptual Model dated August 26, 2002. The CSM, as approved by both EPA and NDEP, is a stand-alone document that is applicable to all Work Plans associated with the Yerington Mine Site."

2) Page 1, 2nd paragraph; The text states that "....units that contain materials,...will be evaluated as to their potential to pose a risk to human health." If an initial screening of the data indicates that there is a potential risk and that a risk assessment is required, where will this assessment be included?

Response: "As stated within the SOW, an evaluation of potential risks associated with the mine units investigated within the Process Areas will be conducted as part of the Final Permanent Closure Plan for the site."

3) Page 4; Add a DQO to identify possible interim actions.

Response: "Though not an objective of the sampling effort, Atlantic Richfield recognizes that results from the proposed field investigations may result in the development of one or more interim actions. Given this potential use for the collected data, the attached Final Draft Process Areas Work Plan has been modified to reflect this comment."

3) Page 5, DQO Step 3; What historical and anecdotal sources will be used to obtain information on process facilities, construction, operations, and maintenance? This should be completed before field monitoring/sampling activities. At a minimum, Atlantic Richfield should review Anaconda and NDEP records, and attempt to interview past employees to determine their potential knowledge of historical usage and/or spills.

Response: "The attached Final Draft Process Areas Work Plan has been modified to incorporate comments from NDEP's on-site contractor, including references to specific documents and maps brought to Atlantic Richfield's attention prior to submitting the attached Draft Final Work Plan. An additional site visit was conducted to verify various process components discussed in the comments to the Draft Process Areas Work Plan. In addition, NDEP records and mine site files were reviewed for useable information to assess historical usage and/or spills.

As indicated above, Atlantic Richfield has attempted to eliminate undocumented anecdotal information (e.g., employee interviews) from providing the basis for field investigations proposed under the Scope of Work. If EPA possesses written information *that documents observations or other historical information, Atlantic Richfield will address such information in the process of preparing a revised Process Areas Work Plan (final version)."*

4) Page 5; The text states that additional focused investigations, if necessary, will take place prior to the Data Summary Report. It is more appropriate to complete these prior to the submittal of the Data Summary Report. One possible alternative is to have a meeting where data and potential data gaps are presented to the Technical Workgroup.

Response: "Atlantic Richfield agrees that, if additional investigations are necessary, they should be conducted prior to the submittal of the Data Summary Report. In addition to having a meeting to discuss the results, another approach may be to prepare a Draft Data Summary Report that can be finalized after some discussions of the data and the need for any additional investigations. The text in the attached Draft Final Work Plan has been modified to reflect this comment."

6) Page 6, Section2.2, page 10; Piping from the buildings and piping outfalls must also be included in the investigation planning.

Response: "Please see responses to above comments."

7) Page 9; Is anything known about the size, depth, manner of construction and current condition of the two wells? Note that since these wells may provide hydraulic connection between the shallow aquifer and deeper aquifers, they should be properly closed.

Response: "Well WW-10 is currently used for monitoring, and limited construction information is provided in the Draft Groundwater Conditions Work Plan (Table 2), currently under review. The second well has been identified as WW-23 (see NDEP comment above), but no information is available for this well. At the appropriate time, all site wells will be properly abandoned according to State regulations."

8) Page 10; Please clarify what is meant by the following text: "...soils that represent general conditions." Also, areas with discolored soils should be sampled or is that what is meant by areas where solutions may have escaped containment?

Response: ""General conditions" was used as another term for background conditions. Given the ambiguity of this term, it has been eliminated from the attached Draft Final Work Plan. In the context of the Work Plan, an area with discolored soils is considered to be a sub-set of areas where solutions may have escaped containment, a broader concept that may be defined by other criteria (e.g., historical records of spills, locations *next to buildings where chemicals were stored or used, and areas where conveyance features may have leaked)."*

9) Pages 10, 11; It is difficult to evaluate the workplan when there are so many different types of areas and COCs present and procedures are generalized. For example, the transformer storage areas and Unison's past operation areas should have the soils analyzed for PCB's and transformer fluids characterized to determine which transformers contain PCB's. Such activities and analyses are not described.

Response: "The attached Draft Final Work Plan includes a table that summarizes the buildings and process areas, number and types of samples, analyses, and historical operations. Atlantic Richfield anticipates that this table will serve to clarify specific details about the proposed field investigations."

It is suggested that for each building/process area, a sampling approach and analyte list be prepared. Since similar areas may have similar analyte lists, the analyte lists can perhaps be presented in several tables such as inorganic, petroleum hydrocarbons, PCBs, etc.

Response: "The attached Draft Final Work Plan includes a table that summarizes the buildings and process areas, number and types of samples, analyses, and historical operations."

10) Page 11; Field screening is not appropriate as the sole mechanism to screen samples for additional laboratory analysis. Field screening can be useful to focus an investigation once a contaminant has been verified by laboratory analyses. Please revise the sampling proposal.

Response: "Field screening, as described in the Draft Process Areas Work Plan, is an appropriate method to identify areas for additional laboratory analyses for hydrocarbons and metals. Given the available information on ore beneficiation operations that were conducted at the mine site, chemical uses and storage in identified buildings, and the character of process solutions or other fluids that were conveyed in identified pipelines, a comprehensive evaluation of the Process Areas is presented in the attached Draft Final Work Plan. The attached Draft Final Work Plan includes sampling and analyses for potential contaminants that are not suitable for field screening. Proposed field investigations in the revised Work Plan will adequately document the nature and extent of potential impacts in the Process Areas."

Note that field screening analytical kits are available for PCBs and would be useful. The PID instrument does not provide readings in ppm. Readings are in PID units. PIDs also use several different lamps sensitive to different compounds such as benzene. PIDs will not detect non-volatile organics or even volatile organics heavier than those of the specified lamp used. Thus, PID readings may indicate a material that should be analyzed, but cannot be used to screen out materials from analysis.

Response: "The PID instrument would be used to provide positive indication of the presence of volatile organic compounds, resulting in the subsequent collection and laboratory analysis of soils identified by this field screening procedure. The laboratory analyses will provide data for the presence or absence of specific constituents. Where no indication of organic vapors are indicated by the PID instrument, soil samples would still be collected on the basis of supplemental knowledge and/or field observations. Thus, the PID is not the exclusive means of determining sample locations, but is simply one of the field tools available to assist in collection of samples within a particular area or excavation. The attached Draft Final Work Plan has been modified to clarify this issue.

The Thermo Environmental 580B PID instrument, with integral microprocessor, provides measurements in parts per million (by air volume) of volatile organic vapors (not to be confused with ppm in the soil). It is not, however, compound specific (i.e., it detects all volatilized organic vapors), and so is used only as a qualitative indicator of the presence of organic vapor. Numerous field screening kits for various constituents are available (e.g., PCB, TPH/BTEX, VOCs) that can detect compounds at various detection limits and ranges. These would certainly be considered for non-volatile organic constituents, such as pesticides or PCBs. However, for volatile organic compounds, Atlantic Richfield believes that the OVM (organic vapor monitor) or PID is the best choice in terms of initial screening. As stated in the response to NDEP comments, additional laboratory analyses of organic compounds is proposed."

11) Pages 11-12, (and page 4); Since samples will generally not be collected at depths over one foot and since no leach testing of samples, shallow or deep, is proposed, the problem statement (page 4) regarding possible impacts to shallow groundwater is not satisfied. It will still not be known whether materials in the process areas can leach COCs to the shallow groundwater.

Response: "The Draft Process Areas Work Plan (pg.12, third paragraph) states: "Field screening results would be used to determine whether any additional excavation and sampling activities were (will be) necessary to delineate the vertical or lateral extent of soils potentially contaminated by petroleum products at a particular location. If soil paste pH values are measured at less than 5.5 and/or organic vapors are detected to be greater than 20 ppm-v at three feet bgs, an additional composite sample would be collected and stored. This procedure would continue at depths of six feet, ten feet, and every five-foot depth after ten feet bgs until field screening criteria are met (i.e., pH *greater than 5.5 and organic vapors less than 20 ppm-v). Thus, sampling at depth may at specific locations if field screening or initial sampling and analytical activities demonstrate the need for such sampling."*

12) Page 10 - It is difficult to evaluate the workplan when there are so many different types of areas and COCs present and procedures are generalized. For example, the transformer storage areas should have the soils analyzed for PCBs and transformer fluids characterized to determine which transformers contain PCBs. Such activities and analyses are not described.

Response: "Please see the response to comment no. 9."

It is suggested that for each building/process area, a sampling approach and analyte list be prepared. Since similar areas may have similar analyte lists, the analyte lists can perhaps be presented in several tables such as inorganic, petroleum hydrocarbons, PCBs, etc.

Response: "Please see the response to comment no. 9."

13) Page 11; Field screening is not appropriate as the sole mechanism to field screen samples for additional laboratory analysis. Field screening can be useful to focus an investigation once a contaminant has been verified by laboratory analyses. Please reconsider the sampling proposal.

Response: "Please see the response to comment no. 10."

14) Page 11; Other potential contaminants of concern should be analyzed. For example, in the areas that Unison operated, PCB analyses should be included.

Response: "The attached Draft Final Process Areas Work Plan has been modified to incorporate this comment."

15) Pages 11-12, (and page 4); Since samples will generally not be collected at depths over one foot and since no leach testing of samples, shallow or deep, is proposed, the problem statement (page 4) regarding possible impacts to shallow groundwater is not satisfied. It will still not be known whether materials in the process areas can leach COCs to the shallow groundwater.

Response: "Please see the response to comment no. 11."

16) Page 12, First Bullet; Note previous comments on use of PIDs. PIDs cannot be used to screen out materials from analysis.

Response: "Please see the response to comment no. 10."

17) Page 12; How will samples at increasing depths 6, 10, 15 feet etc. be obtained?

Response: "The attached Draft Final Process Areas Work Plan has been modified to clarify that samples at depth will be collected by an appropriate method (e.g., hand auger, excavation with a backhoe, or borings)."

18) Page 13; A pH 0-14 litmus paper will not provide a quality assurance check on the pH instrument. pH papers come in various ranges, not just 0-14. Also, there is no assurance that the paper is more accurate than the pH instrument.

Response: "Qualitative pH values in the field would be measured with a pH meter, after formulation of a soil paste at a 1:1 volume ratio of distilled water to soil, in accordance with published procedures. Litmus paper would not be used as an accurate check of the meter, simply a qualitative check. Calibration and field buffer solution checks would be used to provide more accurate QA. The Draft Final Process Areas Work Plan has been modified to clarify this."

19) Table 4; Please check your table for proposed metals and methods of analyses. At a minimum, antimony, silver, PCBs and thallium should also be included.

Response: "The attached Draft Final Process Areas Work Plan has been modified to incorporate this comment."

If you have any questions regarding the revisions to the attached document, or the responses to comments, please contact me at 1-406-563-5211 ext. 430.

Sincerely,

Dave McCarthy
Project Manager

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Appendix A. Job Safety Analysis Forms

SECTION 1.0
INTRODUCTION

Atlantic Richfield Company has prepared this Draft Process Areas Work Plan (Work Plan) for various mine units located in and around the former Mill and Precipitation Plant area (Process Areas) within the Yerington Mine Site. This Work Plan describes site investigation activities to be conducted pursuant to the Closure Scope of Work (SOW). The SOW (Brown and Caldwell, 2002a) states: "Soils in the mill/process and precipitation plant areas will be characterized with respect to their potential to pose a risk to human health or the environment. These areas include on-site process buildings, ditches, tanks and vats. Generally, soils will be analyzed for whole rock chemical analyses. The soils characterization program will be used to support the final closure plan for the process areas". The proposed soils investigations will also be used to evaluate potential impacts to groundwater.

Soil sample collection, materials characterization and analytical activities described in this Work Plan will support the development and evaluation of closure alternatives for process components, to be presented in a comprehensive Final Permanent Closure Plan (FPCP) for the site. The FPCP will identify mine units and components that will be subject to demolition, cover and/or removal and disposal. Beneficiation units that contain, or contained, materials that pose an ecological or human health risk will be evaluated as part of this Work Plan.

The remainder of Section 1.0 of this Work Plan describes the location and hydrologic setting of the Process Areas, previous monitoring and sampling activities, and Data Quality Objectives. Section 2.0 presents information about the construction and operational history of the Process Areas, and a description of modifications over time based on an interpretation of aerial photography and topographic maps. Section 3.0 of this Work Plan presents proposed sampling locations, sampling protocols and analyses for soils in accordance with the Draft Quality Assurance Project Plan (QAPP). Section 3.0 also presents a task-specific Job Safety Analysis in the context of the more comprehensive Health and Safety Plan developed for the Yerington Mine Site. Section 4.0 lists references cited in this Work Plan.

1.1 Location and Operational History

The Yerington Mine Site is located approximately one mile west of the town of Yerington in Lyon County, Nevada (Figure 1). The area of process components addressed in this Work Plan is located in the central portion of the mine site, as shown in Figure 2.

The Anaconda Mining Company, predecessor of the Atlantic Richfield Company, began mining operations in the early 1950s. From 1953 to 1965, operations at the site consisted of mining the Yerington Pit for copper oxide ores. The copper oxide ores were processed using a Vat Leach extraction process. The Vat Leach process involved crushing of graded, pit-mined oxide copper ore to a uniform, minus 0.5-inch size. The crushed ore was loaded into one of a row of eight large concrete leach vats where a weak sulfuric acid solution was used to produce a pregnant leach solution. This solution was passed on to precipitation cells located nearby, where copper was precipitated onto scrap iron and de-tinned cans. The barren solution then passed to iron launders where excess iron was removed, then re-acidized before re-circulating in the Leach Vats. Tailings were deposited as solids in the Oxide Tailings Area. The copper concentrate was sent off site for smelting.

In 1965, the mill and concentrator were modified to allow processing of both oxide and sulfide ores. The sulfide ore process circuit involved fine crushing and copper sulfide recovery by chemical flotation, in which lime was added to the process solution to maintain a basic pH. Sulfide tailings were conveyed as slurry to the Sulfide Tailings Area. A copper concentrate was produced from the sulfide ore, and was also shipped off site for smelting. Historic records also indicate that dump leaching of the W-3 Waste Rock dump began in 1965 where sulfuric acid was applied to the W-3 Waste Rock dump to increase copper production (Anaconda, 1965).

In 1989, Arimetco International initiated leaching operations at the mine site, with little disturbance in the Process Areas. The Arimetco Electrowinning Plant and associated process components are covered by a companion Work Plan, and are located south of the Process Areas (Figure 2). The Process Areas that are described in this Work Plan cover an area approximately 5,000 feet long and 2,000 feet wide, or about 230 acres.

1.2 Hydrologic Setting

The principal source of water in the Yerington area of Mason Valley is from the Walker River (Huxel, 1969). The East and West Walker Rivers originate in the Sierra Nevada and merge south of the mine site, from where the Walker River flows northward through the valley to Walker Gap. From Walker Gap, it turns eastward and then southeastward to Weber Reservoir and ultimately to its terminus at Walker Lake. The Walker River is the primary source of natural recharge to the alluvial ground water flow system that underlies the mine site, given that recharge from precipitation is very low (the annual average precipitation rate in the area is 5.46 inches per year; Huxel, 1969).

In general, the subsurface below the mine site consists of unconsolidated alluvial deposits derived by erosion of the uplifted mountain block of the Singatse Range and alluvial materials deposited by the Walker River. These unconsolidated deposits, collectively called the valley-fill deposits by Huxel (1969), comprise four geologic units: younger alluvium (including the lacustrine deposits of Lake Lahontan), younger fan deposits, older alluvium and older fan deposits. Lake Lahontan lacustrine deposits appear to have been removed and reworked by the Walker River as it meandered back and forth across the valley Huxel (1969). Huxel estimated that Pleistocene Lake Lahontan in Mason Valley persisted for a relatively short time and was less than 60 feet deep. Groundwater conditions at the Yerington Mine Site are the subject of a companion Work Plan.

1.3 Previous Investigations and Monitoring

Soil samples from the Process Areas have not been collected for analysis as part of previous site investigation activities. The U.S. Environmental Protection Agency (EPA, 2000), as part of site characterization activities in October 2000, collected a water sample from a “flooded, underground room” in the area of process components.

1.4 Data Quality Objectives

The Data Quality Objectives (DQOs) for field sampling and analytical activities described in this Work Plan include the collection of appropriate data to support the:

- Assessment of current ecological and human health risk associated with surface materials and process solutions, and the potential for these materials and solutions to be conveyed to possible down-wind and down-gradient receptors, respectively; and
- Development and evaluation of closure alternatives for mine closure units within the process areas at the Yerington Mine site, including the demonstration of chemical stability.

In order to ensure that data of sufficient quality and quantity are collected to meet the project objectives, the four-step DQO process listed below was utilized to develop the activities described in this Work Plan:

- Step 1. State the Problem;
- Step 2. Identify the Decision;
- Step 3. Identify the Inputs to the Decision; and
- Step 4. Define the Boundaries of the Study.

The problem statement (Step 1) is as follows: "Process Areas may represent a risk to human health and the environment and may have historically been, or currently represent, a source of constituents of concern to willow groundwater". These Process Areas contained solutions and petroleum products, which could have potentially contaminated soils with the potential to impact groundwater. Also, it is unknown whether the Process Areas currently represent a source of fugitive dust that could be suspended and transported to down-wind receptors. Figure 3 presents the Site Conceptual Model flow diagram that depicts the relationships between potential sources, including those in the Process Areas, and potential migration pathways and receptors.

Step 2 of the DQO process (Identify the Decision) asks the key question that this Work Plan is attempting to address: "What monitoring, sampling and analytical activities for the Process Areas will serve to meet the stated objectives of evaluating current ecological and human health risk and development of closure alternatives". The results of field monitoring and sample collection and analysis activities proposed in this Work Plan will be compared to existing information and integrated with results from site investigations for other surface mine units. These results will also be evaluated to determine if any interim actions may be necessary.

The results of field investigations will be interpreted and compared to regulatory standards or guideline values, and may provide the basis for answering this question. Results from initial and, if available, subsequent investigations, will be included in the Draft Data Summary Report. Later results from subsequent investigations could be added to the Final Data Summary Report. The criteria necessary to determine if the proposed Work Plan activities will answer this question include:

- Will the collected data adequately document the quality, quantity, and potential migration pathways of materials associated with the Process Areas?
- Will the collected data provide an appropriate baseline to assess the effects of closure of the Process Areas?

Step 3 of the DQO process (Identify the Inputs to the Decision) identifies the kind of information that is needed to address the question posed under Step 2. Relevant historical and anecdotal information includes knowledge of process facilities construction, operations and maintenance, previous field monitoring and analytical results, and down-gradient receptors. The information obtained from review of Anaconda records, on-site maps, NDEP records, site visits, interviews with mine personnel, and the proposed field monitoring and sample collection and analytical activities (described in Section 3.0) provide the inputs to address the problem statement.

Step 4 of the DQO process (Define the Boundaries of the Study) defines the spatial and temporal aspects of the field monitoring, sampling and analytical activities proposed in this Work Plan. The field and analytical activities described in this Work Plan will be conducted in 2003 within the boundaries of the Process Areas shown in Figure 2.

SECTION 2.0

DESCRIPTION OF PROCESS AREAS

2.1 Overall Status and Land Use

Mining and ore beneficiation operations at the mine site have ceased and, with the exception of fluid management associated with Arimetco heap leach process components (described in the Heap Leach Work Plan), the Process Areas shown in Figure 2 are no longer active. Electrical, gas, and water services to all buildings within the Process Areas have been disconnected, except for the Administration Building and the Equipment Garage. All heavy mining equipment and haul trucks have been removed from the mine site. The land status of the approximate 230-acre area is also shown in Figure 2.

Table 1 provides a summary of the buildings and an inventory of components within the Process Areas, which are shown in detail in Figures 4 and 5. Figure 6 shows underground sewer, spent solution, and utility lines. Letter-designated mine units and process components, and features without letter designations, are described below.

2.2 Process Component Descriptions and Status

Atlantic Richfield has identified approximately 30 buildings within the Process Areas, as shown in Figure 4, and listed in Table 1. These buildings were used for various purposes relating to ore processing, equipment maintenance, administration and related operational activities. All of the buildings, unless otherwise noted on Figure 4 or in Table 1, are built on concrete slabs and are constructed of sheet metal. Typical construction includes concrete pavement of some sort in front of doorways or overhead doors, and some of the buildings contain attached concrete structures such as loading docks or secondary containment structures for storage tanks. The Assay Lab (F) has a partial basement at its south end. An open basement foundation also exists southwest of the Anaconda Solution Tanks (DD). In addition to buildings, concrete structures (e.g., foundations, ramps) and tanks within the Process Areas will be investigated.

Administration Building (A)

The Administration Building contains offices, office storage rooms, restrooms, and a garage. It is currently being used as an office for document storage and for outside contractors overseeing fluids management. In the parking lot approximately 50 feet from the northeast side of the Administration Building, a refilling station pump island with two pumps was removed in 1998. The mine superintendent at the time reported that no product piping was connected to the pumps when they were removed. Documentation was not found as to whether or not underground storage tanks still exist or were removed prior to the pump island removal.

Old Tire Pile (B)

Several old haul truck and vehicle tires are stored on the ground in a large pile northeast of the Process Areas, visible on Figure 4.

Equipment Wash Building (C)

This building is next to the Truck Wash and Paint Shop and contains piping lines that were connected to former “cleaning solution” tanks. A concrete sump sets along the outside east wall of the building.

Change House (D)

The building was used as a dressing room and showers and is empty except for some dry scraps of materials. A small former lab is present at the north corner of the building.

School House (E)

The School House contains chairs and file cabinets in one half of the building and stored core samples and file storage in the other half. There are restrooms present in the building.

Assay Laboratory (F)

Chemicals remaining in the Assay Laboratory consist of a two-liter bottle of ammonium hydroxide, some ammonium hydrogen fluoride, and approximately 20 gallons of sulfuric acid. Various laboratory equipment are also present inside the building. The building contains a loading dock along the southwest side of the building, and a basement at the southeast end of the building that is below approximately one third of the first floor area.

Large Warehouse (G)

The warehouse contains fittings, supplies, miscellaneous scrap steel, debris, and some tools. A two-inch diameter pipe is protruding from the ground at the north corner of the building.

Small Warehouse (H)

There are 91 used transformers and oil-filled switches being stored in the Small Warehouse, and most of the transformers have been tagged as containing PCBs.

Fire Engine Storage (I)

Six large used transformers are currently being stored in the Fire Engine Storage building, and some of these transformers are labeled as containing PCBs. The rest of the building is empty.

Grease Shop #1 (J)

This small storage building is empty.

Truck Shop (K)

The Truck Shop contains 129 55-gallon drums, most of which are empty, and 41 55-gallon drums that contain used oil and zeolites. The Truck Shop also contains approximately 30 five-gallon buckets containing various oils and oil-soaked trash. Some of the drums are damaged and leaking, some contain dried residue with flammable labels or PCB labels, and at least one drum is unlabeled. At the northwest end of the Truck Shop, three oil tanks of approximately 3,000-gallons capacity inside concrete secondary containment are located outside the building. Electrical transformers were re-conditioned inside the Truck Shop in the 1980s by a company named Unison. A floor trench inside the building contains approximately one foot of oily liquid. A floor drain exits the Truck Shop with a discharge point to the ground surface approximately 600 feet to the northeast of the building. Several areas are present on the concrete floor where former floor drains have apparently been filled in with cement.

Equipment Garage (L)

An unknown number of 55-gallon drums are stored at the Equipment Garage.

Truck Wash and Paint Shop (M)

The building has two large overhead doors where vehicles entered. Some oil staining is apparent on the ground surface outside of the building doors.

Carpenter Shop (N)

The shop is empty except for scrap supplies and a few tools and equipment. A small concrete sump with a valve is present outside the west wall of the building.

Lead Shop (O)

The shop is empty.

Leach Vats (P)

Eight leaching vats, each 10 feet apart, are shown in Figure 4. Each vat measures120 feet by 135 feet by 20 feet deep, with 18-inch concrete walls and concrete floors. The vats were used to percolate acid leach solution through the crushed ore and, subsequently, the application of rinse solution.

Quonset Hut (Q)

A quonset-style building and fenced-in storage yard are present north of the Administration Building. The building and storage yard contain old scrap electrical supplies such as wire, switches, lights, and control equipment. The yard was formerly used to store transformers, and at least one old transformer is still present in the storage yard.

Emergency Shed (R)

The building is empty except for stored soil samples and scraps of materials.

Sheet Metal Shop (S)

The building is empty except for scrap and debris on the floor. An attached shed on the east wall of the building is locked and labeled "Diesel".

Storage Building (T)

The building contains scrap piping and a portable generator.

Filling Stations (U, W, X)

One petroleum filling station (U) consists of two above-ground storage tanks that are not housed in a building. The tanks are currently being used to refuel vehicles. There is one 10,000-gallon tank in secondary containment consisting of an earthen berm and plastic liner, and a second tank of 1,000-gallon capacity with no secondary containment. A former petroleum filling station (W) has fuel pumps located in the station shed and two two-inch underground lines protruding from the ground outside the southeast end of the building, a possible indication of the presence of underground petroleum storage tanks. Another former gasoline filling station (X) is plastic-lined with pipes protruding from the ground and fuel pumps located in the station shed, a possible indication of the presence of underground petroleum storage tanks.

Grease Shop #2 (V)

The small building contains dry scrap and debris.

Electrical Shop (Y)

The shop contains shelves of electrical equipment and supplies, including wire, fittings, and devices.

Used Oil Tank (Z)

An 1,800-gallon used oil tank is present north of the Truck Shop. The tank is inside secondary containment, but some oil staining is apparent on the ground surface near the secondary containment.

Core building (AA)

The Core Building is located southwest of the Process Areas and contains several hundred boxes of core samples on shelves. There is no apparent indication as to the nature of prior operations or use of the building. The building is constructed of sheet metal on framework with a dirt floor.

Water Tank (BB)

There is a single water tank located northwest of Yerington Pit and approximately 1,500 feet southwest of the Leach Vats. The tank was used to supply water for the mine and for Weed Heights, and is currently out of operation. The capacity and volume of water remaining in the tank is unknown.

Primary Crusher Foundation (CC)

The Primary Crusher was used to crush the ore to a five-inch product before being sent on to the Secondary Crusher, which reduced it to 0.5-inch diameter. All that remains of the Primary Crusher is the concrete foundation and walls. Overhead conveyors transported crushed ore to the ore stockpile north just north of the Primary Crusher, and from the ore stockpile to the Secondary Crusher. The overhead conveyors emerged from the ground next to the stockpile and the Primary Crusher, and concrete structures may be buried below ground.

Solution Tanks (DD)

The Solution Tanks consist of concrete floors and concrete walls approximately 18 feet tall. The southernmost Solution Tank is currently being used to store chemicals or petroleum products in approximately 280 55-gallon drums and soils in nine plastic 250-gallon containers. Several of the drums are damaged, and some are labeled as containing PCBs.

Precipitation Plant (EE)

The Precipitation Plant consisted of fifteen parallel concrete launders filled with light gauge scrap iron that were used to precipitate copper from the leach solution. Each launder measures 10 feet by 58 feet by five feet deep. The entire plant is approximately 600 feet long. The launders still contain some scrap iron. There are several 55-gallon drums stored in one of the launders at the southeast end of the plant.

Solution Tanks, Electrical Building and Basement (FF)

The electrical service equipment for Solution Tanks and Leaching Vats is out of service.

Sulfide Plant Office (GG)

This office is empty with the exception of archived soil samples.

Sulfide Plant (HH)

All buildings in the Sulfide Plant area have been removed, and only concrete structures remain. These concrete structures cover an area approximately 800 feet by 400 feet and consist of foundations, slabs, columns, trenches, ramps and thickeners. All of the thickeners have been filled with alluvial material. Two concrete-lined conveyor ways run from the bottom of the sulfide fine ore stockpile, underneath the road, and up into the Sulfide Plant. These conveyors are approximately 175 feet long (Figure 4).

Concrete Ramps (II)

Two sloped concrete ramps. The original purpose for the ramps is unknown.

Low Area (JJ)

An area at a lower elevation than the general ground surface at the Process Areas exhibits apparent runoff accumulation.

Low Area (KK)

An area at a lower elevation than the general ground surface at the Process Areas exhibits apparent runoff accumulation.

Drum Storage (LL)

This area contains 23 drums of tar that show some leakage to the ground, outside of the northeast portion of the Equipment Garage (L).

Truck Shop Floor Drain Outlet (MM)

The Truck Shop (K) floor drain runs underground from the Truck Shop to an open area to the northeast, indicated on Figure 4. The exact nature of fluids transported through the drain is unknown.

Stacker Area (NN)

This conveyance area between ore crushers has had all components removed, and has been re-graded.

Secondary Crusher Area (OO)

The Primary Crusher was used to crush the ore to a five-inch product before being sent on to the Secondary Crusher, which reduced it to a nominal 0.5-inch diameter. The Secondary Crusher building is present to the west of the Primary Crusher area (CC). The Secondary Crusher cones along the north side of the building have been completely removed, but the concrete foundations remain. An underground concrete conveyor way exists underneath the Secondary Crusher cone foundations, between the Secondary Crusher and the ore stockpile just north of the Primary Crusher. Underground concrete conveyor ways (Figure 4) are also present between the Secondary Crusher area and just south of the Mega Pond.

Acid Tanks (PP)

The inventory of acid tanks is summarized in Table 2. Currently, four above-ground acid tanks are located approximately 1,400 feet southwest of the Phase Four VLT Heap Leach (Figure 5). A 50,000-gallon metal sulfuric acid tank is situated within an earth-bermed, plastic-lined secondary containment area. Approximately 30 feet outside of the 50,000-gallon tank secondary containment, an approximate 10,000-gallon acid tank is laying on its side on the ground with chocks to prevent rolling. Two metal sulfuric acid tanks of approximately 5,000-gallon capacity are located approximately 70 feet northwest of the 50,000-gallon tank. These two tanks are situated in an earth-bermed, plastic-lined secondary containment. Soil within the secondary containment and at the end of an outlet pipe outside the secondary containment is yellow-colored. The contents of all the acid tanks have been drained, but the tanks have not been cleaned out. The volume of residual acid in the tanks is unknown.

Airmetco Crusher/Hopper (QQ)

The components have been removed and the area has been re-graded.

Stacker Area (RR)

A lined stockpile area existed on the area where the former Stacker was located. Acid-treated crushed ore was placed on the stockpile area. After the Crusher Plant was removed, the stockpile area was excavated and placed on the VLT Leach Pad.

Former Acid Plant (SS)

The Acid Plant was located where the Phase III - South Heap Leach Pad is currently situated (Figure 4). Historic records indicate that the Acid Plant produced sulfuric acid solution as early as 1954, and continued production of approximately 200 to 450 tons of sulfuric acid per day until at least 1975 (Anaconda, 1954). Calcines in the reactor bed were apparently a by-product of the acid production process, and calcine solution was discharged from the plant to the "north fence" by means of a concrete ditch from the Acid Plant (Figure 4). A wet-scrubber and mist precipitators were also used in the Acid Plant for dust control, to remove calcines and other solids entrained in the off-gas (sulfur dioxide).

A former solution pond (XX shown on Figure 4) was located to the south of the Acid Plant, shown on a historical photo as containing a reddish-orange solution. There is no longer any surface expression on-site of the exact location of the pond.

Motor Cargo Building (TT)

The city of Weed Heights operates the Motor Cargo Building and surrounding fenced-in storage yard for equipment and supplies storage. Several 55-gallon drums of unknown content exist inside the fenced storage yard. The exact nature of operations inside the building is uncertain. The Motor Cargo Building is located northwest of the Core Building, to the southwest of the former Acid Plant.

Old Crusher Site (UU)

A concrete foundation that exists near the southeast corner of the Phase II Heap Leach Pad was a former crusher area. The foundation has no structures or equipment attached. Next to the foundation is an area where a former acid tank may have been located. The ground surface around the former tank area is discolored yellow.

Tailings Pumphouses (VV)

Two buildings containing large pumps and associated piping are located east of the Evaporation Ponds (Figure 2). The easternmost building was named the Tailings Pumphouse and contains two large pumps with approximate 16-inch diameter piping entering straight into the ground and underground out to the south. The other building consists of large pumps on a raised concrete deck, associated piping, and a concrete holding tank with level gauge. The exact nature of previous operation of the Tailings Pumphouses, including source area and receiving area of the pumped fluid, is uncertain.

Former Calcine Ditch (WW)

Collected dust from the dust suppression process inside the Acid Plant was directed to four calcine launders, concrete troughs covered with steel plates. Water from the leaching plant is reported to have been pumped to the head of each launder to sequester the dust (Joe Sawyer; personal communication, 2002).

Former Pond (XX)

A pond was located northwest of the former Acid Plant (SS).

Sulfide Ore Stockpile Area and Underground Conveyors (YY)

Two underground concrete conveyor ways exist from the former sulfide ore stockpile to the Sulfide Plant (HH).

Surface Pumps Foundation (ZZ)

An above-ground concrete foundation exists just east of the middle Evaporation Pond in a low area near the northeast boundary of the mine site. The structure is a concrete holding tank approximately four feet deep with a grated inlet on one side at ground surface, and openings in the top that suggest the presence of large pumps. The structure appears to have collected surface water or fluids from the surrounding topographic low area.

Concrete Pump Tank (AAA)

A large abandoned above-ground concrete tank is present east of Well WW-8 at the southern end of the Unlined Evaporation Pond (Figure 2). The tank is approximately 12 feet high and appears to have had pumps attached to an integral concrete platform above the tank. A manhole with an apparent former valve ahead of the tank is present approximately 60 feet to the south of the tank.

Above-Ground Petroleum Storage Tanks

Currently, six above-ground petroleum storage tanks are located at the mine site. Three tanks are located at the northwest end of the Truck Shop (K). Two tanks are located north of the Change House (D). The sixth tank is a used-oil tank, and is located north of the Truck Shop (K). Table 2 summarizes the inventory of above-ground tanks including type, contents and secondary containment.

Wells

There are two wells located in the Process Areas under this Work Plan. Well WW-10 is located along the northwest edge of the Sulfide Plant (HH), and WW-23 is located approximately 550 feet northeast of the north end of the Precipitation Plant (EE). Limited well construction information is available on well WW-10, and is provided in the Groundwater Conditions Work Plan.

Utilities

Locations of underground utility lines, including sewer lines, acid lines, and spent solution lines were found on maps at the mine site. The alignments of these underground utilities are shown on Figure 6.

Electrical Stations and Sub-stations

Several electrical sub-stations exist at the mine site, some of which have transformers that have leaked oil. There are at least 67 transformers on-site, either inoperative or still in use, mounted on poles or on concrete pads within fenced-in areas. The building foundation for the former Anaconda power station is partially buried just west of the Administration Building (A). The former Anaconda power station consisted of three one-megawatt generators that were sold when the station was decommissioned.

Other Structures

The Tibbals Storage Building is located to the northwest of Phase II Leach Pad. The Chlorine Addition Station, located south of the privately owned bulk fueling station, is a building where chlorine was added to the potable water system. The building is of sheet metal construction and contains a pump associated with the chlorine treatment process.

SECTION 3.0

WORK PLAN

Atlantic Richfield proposes to conduct field investigations for mine units and components at the Process Areas and related areas shown in Figures 2, 4, 5 and 6. These activities include field screening and sample collection and analyses at approximately 95 locations. The areas of investigation covered under this Work Plan include, but are not limited to:

- Buildings used for maintenance shops, offices, storage, laboratory work, skilled crafts shops, and other ancillary uses;
- Surface and subsurface concrete structures, including foundations, slabs, and holding vessels;
- Soils in areas that represent background conditions within the Process Areas; and
- Areas where solutions may have escaped containment including, but not limited to, discolored soils.

Locations for field screening of soils and alluvium will be based on the following criteria:

- Representative of background Process Area soil conditions;
- Close proximity to areas where recorded, alleged or apparent spills or releases occurred; and
- Close proximity to areas where past activities were conducted that represent a potential source for impact to soil or ground water.

The proposed screening and sampling locations are described in Table 1. The final number and precise location of each screening event may be refined on the basis of observed site conditions at the time of the field investigations. Each location for field screening and soil sample collection will be presented in the Data Summary Report.

3.1 Field Investigations

Field activities will consist of the following:

- Final selection of field screening locations based on field observations and a review of historical records;
- Field screening of soils for sample collection;
- Collection and transmittal of selected soil samples for laboratory analyses;
- Determination if additional samples are required at depth;
- Documentation of sample location selection process and field sampling activities;
- Photographs of structures, excavations and soil sample areas;
- Estimates of building and structure dimensions; and
- Inventory of building and structure materials, and contents.

Soil samples will be collected from excavations by sampling from the backhoe bucket, or from the hand auger or shovel. Sample collection depth will be limited by excavation equipment capabilities, or until ground water is encountered. The anticipated limit of the backhoe excavation capability is approximately 15 feet below the surface of where the backhoe front wheels are setting.

All physical measurements will be recorded to the accuracy allowed by the measurement method. Field screening instruments (pH meter and Photo Ionization Detection or PID) will be calibrated according to manufacturer's instructions. Instrument accuracy limits and calibration techniques will be described in the Data Summary Report. Documented field investigations, descriptions of buildings and structures, and laboratory analytical results will also be presented in the Data Summary Report.

<u>Field Screening</u>

The proposed field screening and potential sampling locations of representative soils in the Process Areas are shown on Figures 2, 4, 5 and 6 and listed in Table 1. Field screening will be conducted for soil pH and volatile organic vapors (Section 3.1) to determine which samples will be submitted to the laboratory for acid-base accounting, whole rock analysis, or gasoline range and diesel range volatile organics. Samples collected for laboratory analysis of all other analytes will be submitted to the laboratory without preliminary field screening. Field screening will be conducted using calibrated pH meter and PID instruments to collect field data on soils collected with a backhoe, hand auger, or shovel. The PID instrument would be used to provide positive indication of the presence of volatile organic compounds, resulting in the subsequent collection and laboratory analysis of soils identified by this field screening procedure. The laboratory analyses would provide data for the presence or absence of specific constituents.

The screening event will identify exposed and sub-surface soils with concentrations of organic vapors (i.e., potential petroleum impact) that exceed 20 parts per million by volume (ppm-v) and/or with paste pH values less than 5.5. If, at any location, organic vapor is detected above 20 ppm-v and/or paste pH values are less than 5.5 standard units, a soil sample will be collected for laboratory analyses at that location from the particular area or discrete interval below ground surface (bgs).

In addition to field instrument measurements, historical information on past operations and olfactory observations in the field will also be used to establish particular sample locations. Thus, the field instruments are not the exclusive means of determining sample locations, but are simply field tools available to assist in collection of samples within a particular area or excavation.

Up to half of the proposed field screening locations that pass the field screening pH criteria (i.e., paste pH values greater than 5.5 s.u.) will be selected for ABA and whole-rock analyses to ensure a representative characterization of soils for an assessment of human health and ecological risk.

Based on the field screening and knowledge of historical operations, discrete or composite samples collected for laboratory analysis for soils potentially impacted by acidic solutions or petroleum hydrocarbons would be subjected to the following laboratory procedures:

- Gasoline and diesel range organics (GRO/DRO) and total petroleum hydrocarbons (TPH) for locations with organic vapor concentrations that exceed 20 ppm-v.

- Semi-volatile and/or volatile organics/solvents (SVOC and VOC), depending on the nature of operations history, for locations with organic vapor concentrations that exceed 20 ppm-v.
- pH and acid-base accounting (ABA) for locations with paste pH values less than 5.5.
- Whole-rock geochemical analyses (WRA) for selected samples with paste pH values less than 5.5.

Field screening results would be used to determine whether any additional excavation and sampling activities were necessary to delineate the vertical or lateral extent of soils potentially contaminated by petroleum products or solvents at a particular location. If soil paste pH values are measured at less than 5.5, and/or organic vapors are detected to be greater than 20 ppm-v within three feet of the ground surface, an additional sample would be collected and stored. This procedure would continue at depths of six feet, ten feet, and every five-foot depth after ten feet bgs until field screening criteria are met (i.e., pH greater than 5.5 and organic vapors less than 20 ppm-v).

A confirmatory soil sample would then be collected at the appropriate depth from the soil (alluvial) depth determined to be unaffected by acidic solutions or hydrocarbons. The initial and confirmatory soil samples would then be submitted for one or more of the laboratory analyses listed above. Determination of which samples are to be submitted for a particular analysis (e.g., GRO/DRO, VOCs, SVOCs, herbicides, pesticides, PCB) would be based on historical operations information and field olfactory observation.

Field inspection of sewer or drain lines will be conducted, where possible, to assess the integrity of the lines. A backhoe would be used to excavate around pipes exiting buildings to observe the condition of the pipe and surrounding soil. An alternative to excavation is utilization of telescopic cameras to identify pipe joints and breaches in pipe, to assist in determining sample locations. Field screening will be conducted below underground piping at locations where inner-pipe telescopic cameras or historical documentation has indicated a release or discharge. If field screening does not indicate organic vapors greater than 20 ppm-v or pH less than 5.5, and impact is not apparent by olfactory means, then no samples will be collected. Exact locations have not yet been determined for sampling of Process Areas underground piping (Figure 6).

Composite Samples

Composite samples are proposed for areas where the potential for impact to the surface or subsurface exists, but the specific depth of apparent or suspected impact to the surface or subsurface has not been identified. These areas are proposed for sampling based on historical operations at each location. If historical operations indicate the potential for surface spills or releases (e.g., drum storage area), then composite samples will be collected from ground surface to 12 inches below ground surface (bgs) from five subsample locations that are representative of the area. The five samples will be composited into a single 0-12 inch composite sample for laboratory analysis. If historical operations indicate the potential for subsurface release (e.g., buried pipeline), then composite samples would be collected from a depth at or just below the potential source and up to three feet below the source, corresponding to intervals of 0-4 inches, 12-16 inches, and 24-28 inches.

Where possible, composite samples will be collected from the surface with a hand auger or small hand shovel to obtain each specific subsample for mixing. Collected material from each subsample will be weighed in the field so that equal aliquots of material are composited at each sample location. If allowed by regulatory authority, as an alternative to weighing each subsample, approximately equal volumes of material will be collected from each subsample location and composited. Collected material will be thoroughly mixed in a plastic mixing tray or bucket, then transferred to the appropriate laboratory container. Locations, depth intervals, weights, and procedures will be field documented in the field notebook. All sample collection and mixing equipment will be washed in a solution of environmental grade detergent and distilled water, and rinsed in distilled water.

3.2 Quality Assurance and Quality Control

Procedures for sample collection and analysis will follow the specifications and procedures described in Section 3.2, including quality assurance/quality control (QA/QC) methods. These procedures, presented in the Draft Quality Assurance Project Plan (QAPP; Brown and Caldwell, 2002b) will ensure that the type, quantity, and quality of data collected are consistent with the DQOs listed in Section 1.4. QA/QC issues for this Work Plan include:

- Appropriate detection limit and laboratory analytical level requirements;
- Appropriate levels of precision, accuracy, and comparability for the data;
- Appropriate quality control protocols (e.g., sample collection, handling, transport, instrument calibration); and
- Appropriate quality assurance protocols (e.g., blanks and duplicate samples).

Sample Collection and Handling

For pH field screening, a solution will be created in the field with soils and de-ionized water, and pH readings will be performed with a calibrated field pH meter. Five grams of soil will be collected from a field screening location and weighed into a four-ounce glass jar, on an electronic digital scale, to the nearest 0.1-gram. A five-milliliter aliquot of de-ionized water will be measured in a graduated cylinder, and added to the five grams of soil. The jar will be sealed with a teflon-lined lid, and shaken vigorously. After 30 minutes of allowing the jar to sit undisturbed, the jar will be shaken again. The lid will be removed and the pH instrument probe inserted into the soil/water solution. After the pH instrument readout stabilizes, the pH measurement will be recorded in a field notebook. At one of ten sample locations, the prepared soil/water solution will be checked with pH litmus paper (0 to 14 pH units) and calibration buffer solutions to provide reasonable quality assurance of the instrument readouts.

For organic vapor measurements, portions of each field screening sample will be placed in a sealed plastic bag and allowed to sit in direct sunlight to generate vapor. Organic vapor readings will then be performed with a portable organic vapor monitor (OVM) equipped with a PID by inserting the OVM inlet into the plastic bag and recording the maximum vapor reading in parts per million by volume (ppm-v).

The composite samples will be placed in containers appropriate for each analysis. All soil samples to be analyzed will be immediately labeled and placed into iced coolers for transport under chain-of-custody to a Nevada-certified analytical laboratory. Soil data, sample collection intervals, and field screening measurements will be recorded on the appropriate excavation log during the investigation. Soil data will include soil color, moisture content, consistency, and a visual estimate of Unified Soil Classification.

If groundwater is encountered during backhoe excavations, the excavation will be discontinued. No groundwater samples from the excavation would be collected because of the potential for groundwater to become contaminated from the excavation activities. Digging through the subsurface exposes ground water to soil that is being pushed or has fallen down from above the water table, compromising the actual water quality. All groundwater monitoring is evaluated in the Groundwater Conditions Work Plan.

Decontamination

All soil collection (sampling) equipment will be decontaminated between each excavation. Disposable scoops or plastic trowels will be used, or sampling equipment will be decontaminated between each sampling location. Sampling equipment will be hand-washed with a solution of tap water and Alconox detergent, then double-rinsed. The decontamination wash would be accomplished with clean buckets, filled half to three-quarters full as follows:

- Bucket 1: Tap water with non-phosphate detergent such as Alconox
- Bucket 2: Clean tap water or de-ionized water.
- Bucket 3: Clean tap water or de-ionized water.

Equipment decontamination consists of the following general steps:

- Removal of gross (visible) contamination by brushing or scraping.
- Removal of residual contamination by scrub-washing in Bucket #1, rinsing in Bucket #2, then rinsing in Bucket #3. Change the water periodically to minimize the amount of residue carried over into the third rinse.

All washing and rinsing solutions are considered investigation derived waste and will be placed in containers. After use, gloves and other disposable PPE should also be containerized and handled as investigation derived waste.

Duplicate Samples and Blanks

Duplicate samples will be collected at a frequency of one per every 10 samples for each analysis. Duplicate samples will be collected by filling the containers for each analysis at the same time the original sample is collected. In general, duplicate samples will be collected in the same manner as regular samples. For quality assurance purposes, duplicate samples will be labeled in the same fashion as regular samples, with no indication that they are QC samples. Each sample from a duplicate set will have a unique sample number labeled in accordance with the identification protocol (refer to QAPP), and the duplicates will be sent "blind" to the lab.

In general, equipment rinsate blanks will be collected when reusable, non-disposable sampling equipment (e.g., water level probe) are being used for the sampling event. A minimum of one equipment rinsate blank is prepared each day when equipment is decontaminated in the field.

Equipment rinsate blanks will be collected to evaluate field sampling and decontamination procedures by pouring laboratory-grade, certified organic-free water over the decontaminated sampling equipment. One equipment rinsate blank will be collected per matrix (e.g., soil, groundwater, etc.) each day that sampling equipment is decontaminated in the field. Equipment rinsate blanks will be obtained by passing water through or over the decontaminated sampling devices used that day. The rinsate blanks that are collected will be analyzed for the same analytes as normal samples. The equipment rinsate blanks will be preserved, packaged, and sealed in the manner described in the QAPP. A separate identification sample number will be assigned to each rinsate blank, and it will be submitted blind to the laboratory.

Field blanks will be collected to evaluate whether contaminants have been introduced into the samples during the sampling procedures. For soil or sediment samples, field blanks will be created by transferring a known source of uncontaminated solid (e.g., commercial sterilized soil) into a sampling container at one of the sampling points. Field blanks will be collected at a frequency of one per every 20 samples, with a minimum of one blank for less than 20 samples.

The exact same collection procedures will be used for the preparation of field blanks as was used for regular sampling. The field blanks that are prepared will be analyzed for the same analytes as regular samples. The field blanks will be preserved, packaged, and sealed in the manner described in the appropriate section for the type of medium being prepared. A separate identification sample number will be assigned to each blank, and it will be submitted blind to the laboratory.

Trip blanks will be prepared to evaluate if the shipping and handling procedures are introducing contaminants into the sample stream and if cross contamination in the form of migration has occurred among the collected samples. Soil and sediment trip blanks will be prepared by transferring a known source of clean, uncontaminated solid into a four-ounce jar, and sealing the lid. The sealed trip blanks are not opened in the field and are shipped to the laboratory in the same insulated chest with the regular samples collected for analyses. The trip blanks will be preserved, packaged, and sealed in the manner described in the QAPP for the type of medium being prepared. A separate identification sample number will be assigned to each trip blank and it will be submitted blind to the laboratory. Trip blanks will be collected at a frequency of one per sampling event per type of matrix, whether that event occurs over one day or several days.

Sample Identification and Preservation

Sample labels will be completed with a permanent waterproof marker and attached to each laboratory sample container before each sample is collected, and will include the following information:

- Sample identification
- Sample date
- Sample time
- Sample preparation and preservative
- Analyses to be performed

- Sample substance type
- Person who collected sample

Each sample will be tracked according to a unique sample field identification number assigned when the sample will be collected. This field identification number will consist of three parts:

- Sampling event sequence number
- Sampling location
- Collection sequence number

For example, the sample collected during the third sampling event at the fourth location sampled will be labeled: 003WD004. Blanks and duplicate samples will be labeled in the same fashion, with no indication of their contents. For example, the duplicate sample to the one stated above might be labeled: 003WD006.

Sample Handling and Transport

The QA objectives for the sample-handling portion of the field activities are to verify that decontamination, packaging, and shipping are not introducing variables into the sampling chain that could render the validity of the samples questionable. In order to fulfill these QA objectives, duplicate QC samples will be used as described below. If the analysis of any QC samples indicates that variables are being introduced into the sampling chain, then the samples shipped with the questionable QC sample will be evaluated for the possibility of contamination.

Each collected sample container will be labeled, sealed with a custody seal, sealed in a zip-loc© bag, logged on a chain-of-custody form, and placed in a cooler with ice. Contained ice will be double bagged in zip-loc plastic bags. The ice chest will be sealed shut with strapping tape and two custody seals will be placed on the front of the cooler so that the custody seals extend from the lid to the main body of the ice chest. If the ice chest is sent by mail, the chain of custody form and other sample paperwork will be placed in a plastic bag and taped to the inside of the ice chest lid, and the ice chest will be labeled with “Fragile” and “This End Up” labels. The samples will be delivered to a laboratory to ensure that holding times will not be violated. Each chain-of-custody will contain the following information:

- Project name
- Sampler's name and signature
- Sample identification
- Date and time of sample collection
- Sample matrix
- Number and volume of sample containers
- Analyses requested
- Method of shipment

For soil or sediment samples collected for ABA or whole-rock analysis, each sample will be collected in zip-loc bags or a five-gallon bucket (see Section 3.5) that will be sealed and labeled with similar QA/QC procedures described for other soil sample labeling and packaging prior to shipment to the analytical laboratory.

3.3 Laboratory Analyses

Solid media samples will be analyzed in accordance with the following protocols, which is summarized in Table 3.

Soil Analyses

Collected soil samples will be analyzed by a Nevada-licensed laboratory. Soil analyses and proposed detection limits are listed in Table 3. Composite soil samples collected as a result of the field screening process would be submitted for some combination of the following analyses depending on the nature of the impacted area:

- Acid Base Accounting including pH;
- Whole-Rock Geochemical Analysis

- Volatile Organic Compounds by GC/MS Capillary Column; Method 8260B;
- Semi-volatile Organic Compounds by GC/MS Capillary Column; Method 8270C;
- Organochlorine Pesticides by Cap Column GC; Method 8081A;
- Poly-chlorinated biphenols by Cap Column GC; Method 8082;
- Chlorinated Herbicides by GC Cap Column; Method 8151A;
- GRO/DRO= Gasoline Range Organics / Diesel Range Organics / Non-halogenated Volatiles including Total Petroleum Hydrocarbons by GC/FID; Method 8015B-GRO, DRO.

Agricultural parameter testing will be conducted for representative composite soil samples throughout the Process Areas. Samples specified for agricultural chemistry evaluation will be submitted to a laboratory experienced in the evaluation of soils for use as a growth medium. The samples will be tested for at least the following values:

- Nitrogen, Phosphorus, and Potassium (NPK)
- Boron and Chlorine
- Calcium, Magnesium and Sodium
- Sodium Absorption Ratio (SAR)

The following soil sample minimum quantities are required:

- For TPH analysis, approximately 0.65 kg, or 8-ounce by volume sample in a clean glass sample jar.
- For ABA, whole-rock and agricultural analyses, two 1 kg samples in clean zip-loc© bags.

3.4 Field Documentation

Summary of field measurement and sampling activities will be recorded in a bound site logbook, and entries must contain accurate and inclusive documentation of project activities. Entries will be made using permanent waterproof ink, and erasures are not permitted. Errors will be single-lined out, should not be obscured, and initialed and dated. The person making the entries will sign at the beginning and the end of the day's entries, and a new page will be started for each day.

The following entries will be made to the bound site logbook and/or filed log sheets:

- General descriptions of weather conditions
- Location of each sampling point
- Data and time of sample collection (field log sheets.)
- The type of blank collected and the method of collection
- Field measurements made, including the date and time of measurements
- Calibration of field instruments
- Reference to photographs taken
- Date and time of equipment decontamination
- Field observations and descriptions of problems encountered
- Duplicate sample location

Photographs will be taken at each field measurement/sampling point. The photo location and number will be recorded on the field log sheets. In addition to the logbook, an inventory of observed or reported chemicals would be conducted during the site investigation. The inventory would record the type of substance (phase and name, or unknown), type of container, and estimated quantity. The sample location coordinates will be recorded via GPS instruments at the time of sampling, or will be staked with identification for GPS surveying at a later time.

3.5 Site Job Safety Analysis

A site-specific Job Safety Analysis (JSA) will be prepared for the Process Areas investigative field work, in accordance with Atlantic Richfield Health and Safety protocol and the Yerington Mine Site Health and Safety Plan (SHSP; Brown and Caldwell, 2002c). The SHSP identifies, evaluates, and prescribes control measures for safety and health hazards, in addition to providing for emergency response at the Yerington Mine site. SHSP implementation and compliance will be the responsibility of Brown and Caldwell. Any changes or updates will be the responsibility of Brian Bass with Brown and Caldwell, with review by Atlantic Richfield Safety Representative Lorri Birkenbuel. Three copies of this plan will be maintained. One copy will be located at the site, one copy will be located in Atlantic

Richfield's Montana office, and one copy will be located in the Brown and Caldwell office. The SHSP includes:

- Safety and health risk or hazard analysis;
- Employee training records;
- Personal protective equipment (PPE);
- Medical surveillance;
- Site control measures (including dust control);
- Decontamination procedures;
- Emergency response; and
- Spill containment program.

The SHSP also includes a section for site characterization and analysis that will identify specific site hazards and aid in determining appropriate control procedures. Required information for site characterization and analysis includes:

- Description of the response activity or job tasks to be performed;
- Duration of the planned employee activity;
- Site accessibility by air and roads;
- Site-specific safety and health hazards;
- Hazardous substance dispersion pathways; and
- Emergency response capabilities.

All contractors will receive applicable training, as outlined in 29CFR 1910.120(e) and as stated in the SHSP. Copies of Training Certificates for all site personnel will be attached to the SHSP. Personnel will initially review the JSA forms at a pre-entry briefing. Site-specific training will be covered at the briefing, with an initial site tour and review of site conditions and hazards. Records of pre-entry briefings will be attached to the SHSP.

Elements to be covered in site-specific briefing include: persons responsible for site-safety, site-specific safety and health hazards, use of PPE, work practices, engineering controls, major tasks, decontamination procedures and emergency response. Other required training, depending on the particular activity, may include MSHA 40-hour training and annual 8-hour refresher courses. Other training may include, but is not limited to, competent personnel training for excavations and confined space, first aid, and cardio-pulmonary resuscitation (CPR). Copies of the 40-hour and annual refresher certificates for site personnel will be attached to the SHSP.

The individual JSA for the Process Areas work incorporates individual tasks, potential hazards or concerns associated with each task, and the proper clothing, equipment, and work approach for each task. The following table summarizes the Process Areas JSA, provided in Appendix A:

SEQUENCE OF BASIC JOB STEPS	POTENTIAL HAZARDS
1. Pre-Construction Safety Meeting.	
2. Sample location setup backhoe	1. Drilling or digging into underground utilities 2. Striking overhead lines or objects with drill mast or backhoe boom.
3. Soil sampling: Backhoe excavation	1. Injury to hearing from noise. 2. Inhalation hazards from dust from drilling or excavation activities. 3. Physical injury from moving parts of machinery. 4. Physical hazards to personnel on the ground in the vicinity of the heavy machinery. 5. Hazard from being in or near excavation.
4. Prepare sample containers and dress in appropriate PPE.	1. Burn or corrosion from acid spillage, if sample bottles require addition of acid or have acid already in them.
5. Collection of soil sample by hand and decontamination of equipment.	1. Skin irritation from dermal or eye contact. 2. Slipping or falling on concrete structures- sharp rock and protruding objects. 3. ENCOUNTERING CONTAINERS WITH SEALED AND UNLABELED CONTENTS ---UNKNOWN !!!! POTENTIAL FOR EXPLOSION OR INHALATION OF POISONOUS VAPOR OR DUST.
6. All Activities	1. Slips, Trips, and Falls due to lack of visibility (e.g., insufficient light), poor housekeeping, improper routes, faulty equipment, or slippery surfaces.
7. All Activities	1. Back injuries during manual handling of materials due to improper load weight and position, repetition, or improper bending of knees. 2. Hand injuries during manual handling of materials due to lack of or improper gloves, sharp edges, slippery surfaces, pinch points, or incompatible substances. 3. Foot injuries during manual handling of materials due to falling objects, pinch points, or spills.

8. All Activities	1. Heat exhaustion or stroke due to high ambient temperature, improper clothing, lack of ventilation, lack of water, or lack of shade.
9.All Activities	1. Hypothermia or frostbite due to low ambient temperature, improper clothing, damp or wet clothing, or lack of source for heat.
10.Unsafe conditions.	1. All potential hazards including but not limited to classified hazardous locations, sudden or unexpected unsafe conditions (fire, chemical release, natural disasters), or confined spaces.

SECTION 4.0

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